AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application. The following listing provides the amended claims with deleted material crossed out and new material underlined to show the changes made.

1. (Currently Amended) A method of scaling a bit budget for encoding a digital video picture, said method comprising:

receiving a plurality of different mapping relationships that specify a plurality of different ways for scaling the bit budget in relation to usage of a decoder buffer, the different mapping relationships based on a plurality of different relaxation levels for encoding the digital video picture, the different relaxation levels corresponding to different levels of concern regarding optimal use of [[a]] the decoder buffer;

receiving a value for identifying a particular relaxation level parameter, said value specifying which of the plurality of mapping relationships is to be used to scale the bit budget of the digital video picture;

from the plurality of mapping relationships, selecting the mapping relationship that corresponds to the particular relaxation level identified by the received value;

based on a decoder buffer usage, scaling the bit budget by using the specified selected mapping relationship; and

encoding said digital video picture by using the scaled bit budget,

wherein the receiving of the plurality of mapping relationships, the receiving of the value for the relaxation parameter, the selecting of the mapping relationship and the scaling of the bit budget are performed by a rate controller.

2-4. (Canceled)

5.   (Currently Amended) A method of tracking digital video information complexity, said method comprising:

determining a complexity measure for a current digital video picture, the complexity measure for the picture accounting for a plurality of macroblocks in the picture;

combining said complexity measure for said current digital video picture to a running average complexity measure for a series of digital video pictures in a manner that prevents said current digital video picture from significantly changing said running average complexity measure for the series of digital video pictures; and

encoding said digital video information utilizing said running average complexity measure,

wherein the determining of the complexity measure and the combining are performed by a rate controller.

6.   (Original) The method of tracking digital video information complexity as claimed in claim 5 wherein said running average complexity is not allowed to change by more than a predetermined percentage.

7.   (Original) The method of tracking digital video information complexity as claimed in claim 5 wherein said running average complexity is processed by a non-linear smoothing filter.

8.   (Currently Amended) A computer-readable medium storing a computer program which when executed by a processor scales a bit budget for encoding a digital video picture, the computer program comprising sets of instructions for:

receiving a plurality of different mapping relationships that specify a plurality of different ways for scaling the bit budget in relation to usage of a decoder buffer, the different mapping relationships based on a plurality of different relaxation levels for encoding the digital

video picture, the different relaxation levels corresponding to different levels of concern regarding optimal use of [[a]] the decoder buffer;

receiving a value ~~for~~ identifying a particular relaxation level ~~parameter, said value specifying which of the plurality of mapping relationships is to be used to scale the bit budget of the digital video picture~~;

from the plurality of mapping relationships, selecting the mapping relationship that corresponds to the particular relaxation level identified by the received value;

based on a decoder buffer usage, ~~a~~ scaling the bit budget by using the ~~specified~~ selected mapping relationship; and

encoding said digital video picture by using the scaled bit budget.

9-11.   (Canceled)

12.   (Previously Presented) A computer-readable medium storing a computer program which when executed by a processor tracks digital video information complexity, the computer program comprising sets of instructions for:

determining a complexity measure for a current digital video picture, the complexity measure for the picture accounting for a plurality of macroblocks in the picture;

combining said complexity measure for said current digital video picture to a running average complexity measure for a series of digital video pictures in a manner that prevents said current digital video picture from significant changing said running average complexity measure for the series of digital video pictures; and

encoding said digital video information utilizing said running average complexity measure.

13.   (Original) The computer-readable medium as claimed in claim 12 wherein said running average complexity is not allowed to change by more than a predetermined percentage.

14. (Original) The computer-readable medium as claimed in claim 12 wherein said running average complexity is processed by a non-linear smoothing filter.

15. (Currently Amended) A method of encoding a sequence of video frames, the method comprising:

allocating an initial value for a bit budget for a current frame in the sequence of video frames;

determining an initial value for a scale value based on a percentage of a memory buffer space used, said scale value for scaling the bit budget to prevent an underflow or an overflow of said memory buffer;

determining a relaxation control value to relax said scaling of the bit budget;

determining a final bit budget for the current frame based on said scale value adjusted with the relaxation control value; and

encoding the current video frame using the final bit budget,

wherein the allocating, the determining of the initial value, the determining of the relaxation control value, and the determining of the final bit budget are performed by a rate controller.

16. (Previously Presented) The method of encoding a sequence of video frames as claimed in claim 15, wherein said scale value is set in a range from 0 to 1, wherein said relaxation value is set in a range from 0 to 1.

17. (Currently Amended) A computer-readable medium storing a computer program which when executed by a processor encodes a sequence of video frames, the computer program comprising sets of instructions for:

allocating an initial value for a bit budget for a current frame in the sequence of video frames;

determining an initial value for an scale value based on a percentage of a memory buffer space used, said scale value for scaling the bit budget to prevent an underflow or an overflow of said memory buffer;

determining a relaxation control value to relax said scaling of the bit budget;

determining a final bit budget for the current frame based on said scale value adjusted with the relaxation control value; and

encoding the current ~~vide~~ <u>video</u> frame using the final bit budget.

18.	(Previously Presented) The computer-readable medium as claimed in claim 17, wherein said scale value is set in a range from 0 to 1, wherein said relaxation value is set in a range from 0 to 1.

19.	(Previously Presented) The method of claim 5 further comprising determining a value for the current digital video picture that represents a deviation between the current digital video picture and an average digital video picture in terms of bits needed to encode the current digital video picture for a particular desired visual quality,

wherein encoding the digital video information comprises using the determined value for the current digital video picture,

wherein the determining the value for the current digital video picture is also performed by the rate controller.

20.	(Previously Presented) The method of claim 15, wherein determining the final bit budget for the current frame comprises multiplying the initial bit budget by the adjusted scale value.

21.	(Previously Presented) The method of claim 15, wherein the scale value adjusted with the relaxation control value is the product of the scale value and the relaxation control value subtracted from the sum of the scale value and the relaxation control value.

22.   (Currently Amended) The method of claim 1, wherein a larger ~~value for the~~ relaxation <u>level</u> ~~parameter specifies~~ <u>results in</u> a smaller scaling of the bit budget for the digital video picture.

23.   (Previously Presented) The method of claim 1, wherein the bit budget is not scaled when the decoder buffer does not deviate from a target path.

24.   (Currently Amended) The method of claim 1, wherein a relaxation <u>level</u> ~~value~~ of 0 ~~specifies~~ <u>results in</u> maximal scaling of the bit budget with respect to decoder buffer usage and a relaxation ~~value~~ <u>level</u> of 1 ~~specifies~~ <u>results in</u> no scaling of the bit budget regardless of the decoder buffer usage.

25.   (Currently Amended) The method of claim 1, wherein the plurality of mapping relationships includes a base mapping relationship when the value ~~for~~ <u>identifying</u> the <u>particular</u> relaxation ~~parameter~~ <u>level</u> is 0, wherein the other mapping relationships are derived by using the base mapping relationship and the value ~~for~~ <u>identifying</u> the <u>particular</u> relaxation ~~parameter~~ <u>level</u>.

26.   (Currently Amended) The method of claim 1, wherein each of the plurality of different mapping relationships maps a plurality of buffer anxiety levels quantifying buffer underflow or overflow to a plurality of scaling values for scaling the bit budget.

27.   (Currently Amended) The method of claim 1, wherein a first value ~~for~~ <u>identifying a first</u> ~~the~~ relaxation ~~parameter~~ <u>level</u> ~~is for specifying~~ <u>results in selection of</u> a first mapping relationship between the decoder buffer usage and the scaling of the bit budget and a second value ~~for~~ <u>identifying a second</u> ~~the~~ relaxation ~~parameter~~ <u>level</u> ~~is for specifying~~ <u>results in selection of</u> a second mapping relationship between the decoder buffer usage and the scaling of the bit budget, wherein the first value ~~is for specifying~~ <u>results in</u> a greater effect on the scaling of the bit budget with respect to the buffer usage as compared to the second value, wherein the first ~~value~~ <u>level</u> corresponds to a greater concern regarding optimal use of the decoder buffer.